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FOREST INSECT INVESTIGATIONS

RM

CONTROL OF THE MOUNTAIN PINE BEETLE IN LODGEPOLE PINE, HOCKETT MEADOW PROJECT, SEQUOIA NATIONAL PARK, 1931-1932

by

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CONTROL OF THE MOUNTAIN PINE BEETLE IN LODGEPOLE PINE, HOCKETT MEADOW PROJECT, SEQUOIA NATIONAL PARK, 1931-32

Including Volumes and Costs of Work in Southern Sierra Lodgepole Type

Introduction

This report embraces the work accomplished on the Horse Creek and Hockett Meadow areas of Sequoia National Park. This work was done in the fall of 1931 and the fall of 1932. An attempt has been made to separate the Horse Creek and Hockett Meadow costs where it is possible with the limited data at hand.

Reason for Initiation of Work

The Horse Creek-Hockett Meadow area contains some of the largest lodgepole pine in California and is very well adapted to recreational purposes. Although it is some 8½ miles by trail from the nearest road, a road will be built in the near future which will open the area to the automobile public. A serious epidemic does not exist at the present time, but it is desirable to keep insect losses as low as possible to preserve the large lodgepole pines which grow there.

Description of Control Area

Areas Treated

a. Legal Description

1. Horse Creek - T 18S, R 31E

Sections		Acreage	
1931	1932	1931	1932
Sec. 4	Sec. 4	10 A.	10 A.
" 5	" 5	135 "	135 "
" 6	" 6	200 "	200 "

T 18S, R 30E

Sections		Acreage	
1931	1932	1931	1932
Sec. 1	Sec. 1	15 A.	15 A.

2. Hockett Meadow - T 18S, R 31E

Sections		Acreage	
1931	1932	1931	1932
Sec. 8	Sec. 8	140 A.	140 A.
" 17	" 17	95 "	95 "
" 18	" 18	230 "	230 "

2. Hockett Meadow - T 18S, R 30E

Sections		Acreage	
1931	1932	1931	1932
Sec. 1	Sec. 1	5 A.	5 A.
" 12	" 12	10 "	10 "
" 13	" 13	120 "	120 "

Note: The area described above has not been surveyed. I have merely designated sections to help locate the areas.

b. General Description

The area of pure lodgepole consists of about 410 acres in the bottom of Horse Creek Canyon and 1500 acres surrounding Hockett Meadow. The elevation varies from 8000 to 9000 feet. Higher up on the hills in the case of both Horse Creek and Hockett Meadow there is a mixed stand of mountain pine and red fir with a few lodgepole pine; but the attack so far has been confined to the pure lodgepole type. The stand of lodgepole is very open and contains a good percentage of large trees from 20 to 50 inches d.b.h.

Organization of Control Work

a. Location of Camp

The main camp was located on Horse Creek. Rather than move camp it was considered cheaper for the men to walk to Hockett Meadow.

b. Organization of Camp

The crew in 1931 consisted of one foreman, who also acted as spotter, one cook, one packer and nine laborers.

In 1932 the crew consisted of one foreman, one cook and five laborers. Trail construction, packer and pack stock were used, and so packing was not charged to bark beetle control.

Approximately 12 men employed in 1931
" 7 " 1932

c. Periods of Work

In 1931 the control work was carried on between May 1 and May 22 inclusive, which totals 22 days. In 1932 control work was carried on between October 19 and November 5 inclusive, which totals 18 days.

Amount of Work Accomplished

a. Spotting

1. The general object was to cut all trees which had a good brood in them and appeared at the same time unable to throw off the attack. However, in the case of a partial attack, where in the judgment of the spotter the tree would survive, it was left.

2. How Worked. A spotting crew composed of appointed rangers made a type map of the area in the fall of 1930. All infested trees were marked in this cruise, which served as a basis for the work in the spring of 1931. Additional spotting was necessary during the control operation, which was carried on with contributed time. In 1932 spotting was done by stripping the area without the use of a compass. Location of trees on the map was gotten from the stumps of the 1931 operation, which were numbered.

I. Trees Marked for Cutting

Very little fade appeared in either 1931 or 1932, although some was noticeable in the spring of 1931. The main indication of the seriousness of the attack was the number and distribution of pitch tubes. Pitch tubes had to be fresh and found all the way around the tree before it was marked for cutting. It was found from experience that the pitch tubes were a fairly reliable indication of the bugs' whereabouts.

II. Trees With Pitch Tubes Not Marked for Treating

Trees which had pitch tubes on one side only were not marked for cutting.

b. Method of Treating Infested Trees

The burning method was used both in 1931 and 1932. The trees were cut and limbed, the limbs thrown over the tree if infested, and if not were piled off to one side. Dry limbs, bark etc. were piled along the sides and on top of the down tree. A fire line some 3½ feet wide had to be cut around the tree, some 6 feet from it. Examination of several trees after burning showed this method to be very efficient.

The main difficulty was the fire hazard. A wide trail had to be cleared and cut down to mineral soil, which in this area is often several inches below the surface. Patrol had to be maintained for several days, even when fires appeared to be out.

In 1932 an attempt was made to use oil instead of dry wood to reduce the fire hazard. The excessive amount of oil necessary to kill the bugs prohibited the use of this method, as the oil had to be packed by horse and man an average of ten miles.

Table 1
Total Amount of Work Accomplished

	Horse Creek		Hockett Meadow	
	1931	1932	1931	1932
Number of trees spotted:	259	103	60	62
" peeled:	4	3	0	0
" burned:	255	100	31	62
Volume spotted				
" peeled	1,130	980	0	0
" burned	158,990	49,350	18,750	27,720
Acreage treated	360	360	1,130	1,130

Table 2
Table of Averages

	Horse Creek: 1931	Horse Creek: 1932	Hockett Meadow: 1931	Hockett Meadow: 1932
Average number of trees per section:	460	183	27	28
" volume " treated--LP:	623	494	605	447
MP:	283	327	---	---

The following tables have not been completely filled in, due to lack of data in the files of the Bureau of Entomology at Berkeley. However, it is desirable to have such information in a summary of this kind, so blank spaces have been left with the hope of filling them in at a later date.

Section 5

Table 3
Itemized Cost of Work - Horse Creek and Hockett Meadow

Item	Time--Hours: 1931	Time--Hours: 1932	Rate of Pay: 1931	Rate of Pay: 1932	Project Funds: 1931	Project Funds: 1932	Contributed Funds: 1931	Contributed Funds: 1932	Project Costs: 1931	Project Costs: 1932
Supervision										
Total Labor Cost					975.75				975.75	
Camp Boss			-----							
Sr. Laborer			4.05							
Laborer			3.67							
Cook			4.05		58.03					
Supplies					5.09				5.09	
Forage and Corral Expenses					81.52				81.52	
Surcharge on Supplies & Forage					5.59				5.59	
Truck Operation and Rental					15.80				15.80	
Total Cost									1085.75	

Note: The cookhouse charge, including food supplies, hauling, equipment etc. was taken care of by a deduction of 35¢ per meal from the basic pay of all men working.

The item "Supervision" was intended primarily to include the time of the Park Naturalist.

Section 6

Table 4

Cost of Spotting and Treating - Hockett Meadow-Horse Creek Project

	1931	1932
Number of trees treated	290	165
" spotted	319	165
Board feet cut	178,870	76,050
Cost per tree*		
" M.B.M.*		
Total cost of project*		
Average size of trees	611 bd.ft.	462 bd.ft.
Number of man-days*		
Cost per man-day*		
Trees per " "		
Volume per " "		

*Left blank because of lack of complete data; these items are very necessary.

Table 5

Cost of Treating from Data Available

	1931	1932
Cost per tree	$ 3.74	$ 2.02
" M.B.M.	6.17	5.55
Total cost of project:	1,083.75	433.24

The 1932 costs do not include packing, supervision and spotting, which helps to make them low.

Table 6

Average Costs

	1931	1932
Cost per tree treated:		
" M.B.M.		
" acre treated:		
" man-day		

This table is a summary of the whole project cost. It is not filled out because of lack of sufficient data.

Explanation of the Method of Constructing the Following Volume Table

In looking through existing volume tables for lodgepole pine it was found that none of them went beyond 30" d.b.h. Having insufficient data for this area, it was necessary to extend the diameters beyond the limits of the lodgepole pine table which came nearest fitting the timber to be scaled.

The table selected was a Scribner Decimal C board-foot table for lodgepole pine in Montana. It was curved out for each half-log length on cross-section paper. A Scribner Decimal C board-foot table for yellow pine of low-site class in Oregon was also drawn on the same sheet. The curves for lodgepole and yellow pine were compared, and the lodgepole curves carried out to 57" d.b.h., the curvature being controlled by the curves for the yellow pine table. These extended curves were then put into regular volume-table form.

Such a table may not be very accurate, but is probably near enough for comparative purposes, and has been so used in this report.

Volume Table for Lodgepole Pine

This table is the extension of a Montana lodgepole pine table which went up to 24 inches DBH. The extended curves were controlled by comparing the lodgepole table with a western yellow pine table for Oregon of a low-site class.

The volumes given below are based on height to a 6-inch diameter inside bark, 18-inch stump and 16.3-ft. logs.

DBH	Height in Logs										
	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
	Volume board feet										
10	4	5	6	7	9	10	12				
11	4	5	6	8	10	11	14				
12	5	6	7	9	11	13	16	18			
13	6	7	8	10	12	15	18	20			
14	6	8	10	12	15	17	20	23	28		
15	7	9	11	13	16	19	22	27	31	35	
16	7	10	13	15	18	22	25	30	35	38	42
17	8	11	14	17	21	25	29	33	39	43	47
18	9	13	16	19	23	28	32	37	43	47	52
19	10	14	18	21	25	30	35	40	47	51	57
20	11	16	20	24	28	33	39	45	51	56	63
21	12	17	23	26	31	37	43	49	55	61	69
22	13	19	25	29	35	41	47	53	60	67	76
23		21	27	32	38	45	52	58	66	74	84
24	17	23	30	35	42	49	56	64	72	81	92
25			32	39	46	53	61	69	79	88	100
26	20		35	42	50	58	67	75	85	96	110
27			38	46	55	63	73	82	92	105	120
28	23		41	50	59	68	78	88	100	113	130
29			44	54	64	74	84	95	108	122	140
30	25		47	58	69	79	90	102	116	132	150
31			50	62	74	84	96	110	125	141	161
32			54	66	80	90	109	117	133	150	172
33			58	70	85	96	116	123	142	160	183
34			60	74	90	102	122	132	151	170	195
35			64	79	95	108	129	140	161	180	206

Volume Table for Lodgepole Pine
(concluded)

DBH	Volume board feet								
36	67	83	101	114	137	148	170	191	218
37		87	107	119	144	154	180	203	230
38		91	113	126	151	164	190	215	245
39		95	119	133	158	173	200	226	256
40		100	125	140	165	182	211	238	272
41			130	147	173	191	221	251	285
42			136	153	182	201	232	263	298
43			142	159	189	210	243	275	311
44			148	166	197	220	255	288	324
45			155	172	205	230	267	301	338
46			161	180	214	240	280	314	354
47				187	223	250	292	327	367
48				195	232	260	304	340	383
49				202	240	270	316	353	397
50				210	251	281	330	367	413
51				218	259	292	344	381	432
52				225	270	303	356	396	450
53				233	278	314	370	412	468
54				241	289	325	385	428	484
55					298	336	399	444	502
56					310	347	413	462	518
57					319	358	429	479	537